

*d'appui*. Its upper part has an adjustment which connects it with one extremity of the tube B.

B. is what we call the Regulator. The extremity of the Regulator B, connected with the collar, has three movements:—1. A movement of elevation, representing the antero-posterior expansion of the chest, the ratio indicated by the most anterior needle. 2. A movement on its axis, representing the difference of expansion between the two lungs, indicated by the needle behind the first one, and 3. A lateral movement.

At the opposite extremity of the Regulator, is attached the transverse tube C, which is nothing more than an ordinary spirit level.

This spirit level has three motions:—1. One which permits it to slide along the whole length of the Regulator, permitting it to be fixed at any point of this latter. 2. A movement round the axis of the Regulator, which enables it to enregister the most trifling differences in the antero-posterior expansion of either lung; and 3. A movement on its own pivot, capable of enregistering the difference in the relative vertical expansion of either side of the chest.

The disks are in pairs:—D.D. serves as a support to the spirit level for the antero-posterior movement of the chest. The pair E.E. possess a peculiar action; they give the exact measurement of the vertical expansion or the elevation of the ribs on the two sides of the thorax. This measurement is indicated by the needle F.F. on the arcs of the circle H.H. graduated in divisions of an inch, and lastly the pair F.F. determine or show the amount of lateral expansion.

When it is desired to determine only the antero-posterior movement, the spirit level may be dispensed with, and it can be detached from the Regulator. We then take one of the disks D.D. and screw it on the ring J, which may be shifted to any point of the Regulator, and can be applied in succession to any part of the chest, either anteriorly or posteriorly, that we desire to explore. Every degree indicated by the disks F.F. correspond to a half inch of lateral expansion. Every degree on the needles indicates one inch of antero-posterior expansion: and every degree, indicated by the disks E.E., corresponds to a quarter of an inch of vertical elevation. The screws, by fastening or relaxing the different pieces of the apparatus, permit the suspension or continuance of all the movements of the instrument.

Under all circumstances of examination the individual, whose chest we wish to explore must be in the recumbent position. If it is wished to ascertain the respiratory capacity of any individual, all that is required is to make him take two or three forced inspirations, and we note on the *Pneometer* the degrees of expansion of the three thoracic movements. Multiply these three factors into one another, and the product will represent in cubic inches the volume or amount of air which has entered the lungs. Comparing this result with the height and weight of the individual, we can easily arrive at a conclusion in regard to the pathological condition of his lungs.

For example: An individual furnishes the three following thoracic expansions: 1. the lateral,  $3\frac{1}{2}$  inches; 2. the antero-posterior,  $2\frac{1}{2}$  inches, and 3. the vertical or that of elevation,  $2\frac{1}{4}$  inches; the product of these three factors gives  $19\frac{3}{4}$  cubic inches of inspired air. Each cubic inch of inspired air, being equivalent to,